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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/650,510
Filing Date: August 28, 2003
Appellant(s): TUSTIN ET AL.

Eric D. Middlemas
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed December 21, 2006, appealing from the Office action mailed July 19, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

Claims 1-8 and 13-15 are under appeal; claims 9-12 and 16-40 remain withdrawn as being directed to non-elected inventions. Appellants timely traversed a restriction/election requirement in a reply filed on October 3, 2005.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,839,331	MAROLDO et al.	06-1989
6,452,043	ZOELLER et al.	09-2002
6,235,673	ZOELLER et al.	05-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

Claims 1-5 and 13-15 stand rejected under 35 U.S.C. 103(a) as being obvious over Maroldo et al. (U. S. Patent No. 4,839,331).

Maroldo et al. teach adsorbent particles made by partially pyrolyzing, in an inert atmosphere, at temperatures of from about 300°C to about 1200°C, polysulfonated, macroporous, vinylaromatic copolymers (considered to read upon **claim 1**). See col. 3, lines 3-12 of Maroldo et al.

In the Examples of Maroldo et al., exemplary polysulfonated particles (defined as beads; see col. 9, lines 7 and 8 of Maroldo et al.; considered to read upon **claim 2**) are depicted; these particles exhibit BET surface areas within the respectively recited ranges in Appellants' **claims 4, 5, and 15**. See Tables 1, 2, 5 and 6 of Maroldo et al., as well as the corresponding Examples.

Additionally, Tables 1 and 6 of Maroldo et al. also show pore volume ranges for the polysulfonated particles. At col. 4, lines 40-48, Maroldo et al. disclose pore diameter ranges categorized as "macropore", "micropore", and "mesopore". Based on

Appellants' definition of "pore volume ratio", i.e., the sum of the macropore volume and mesopore volume divided by the micropore volume, the pore volume ratio of, for example, the polysulfonated copolymer of Example 4A, exhibits a pore volume ratio of (0.44-0)/(0.219+0.0152) = 1.878, or, optionally, (0.44 + .0152)/.219 = 2.078 (based on the definitions of "macropore", "mesopore", and "micropore", as disclosed by Maroldo et al.; the first equation being based on the assumption that the amount of mesopore volume is zero). Thus, the polysulfonated particles of Maroldo et al. are considered to exhibit pore volume ratios comparable to those recited in **claims 5 and 15**.

The particles are polysulfonated by contacting the macroporous resin with fuming sulfuric acid (also known as oleum) for a period of from about 5 hours to about 20 hours or more at temperatures ranging from about 100°C to about 150°C. See col. 4, line 57 to col. 5, line 5 of Maroldo et al. (considered to read upon the limitations of **claim 13** regarding the "sulfonation conditions of time, temperature and pressure...", i.e., **step (i)**), which also discloses that the polysulfonated resin is preferably hydrated, then washed to remove acid and dried prior to calcining (considered to read upon **step (ii) in claim 13**).

The pyrolysis may be performed at temperatures from about 300°C to about 1200°C; further, the particles may be agitated and/or heated with steam or hot gases. See col. 5, lines 6-16 of Maroldo et al. (considered to read upon **step (iii) in claim 13**).

Maroldo et al. also teach that the pyrolyzed polysulfonated particles may be further activated by exposure to gases such as oxygen, steam, ammonia, and carbon

dioxide at temperatures ranging from about 300°C to about 1200°C or more. See col. 5, lines 36-42 of Maroldo et al. (considered to read upon **claim 14**).

Maroldo et al. is silent with respect to the particle size of the polysulfonated particles. However, because Maroldo et al. disclose carbonized polysulfonated polymer particles exhibiting surface areas and pore volume ratios comparable to that respectively claimed, it would have been obvious to one skilled in the art at the time the invention was made to reasonably expect that the particles of Maroldo et al. would also exhibit particle sizes comparable to that respectively claimed, absent the showing of convincing evidence to the contrary.

It is well settled that when a claimed composition appears to be substantially the same as a composition disclosed in the prior art, the burden is properly upon the applicant to prove by way of tangible evidence that the prior art composition does not necessarily possess characteristics attributed to the CLAIMED composition. In re Spada, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Circ. 1990); In re Fitzgerald, 619 F.2d 67, 205 USPQ 594 (CCPA 1980); In re Swinehart, 439 F.2d 2109, 169 USPQ 226 (CCPA 1971).

Additionally, although Maroldo et al. disclose the employment of "20% oleum" (Example 3) and "4% oleum" (Example 21), the reference does not specifically disclose "30% oleum", as recited in claim 13. However, Maroldo et al. at col. 4, lines 57-59 disclose that it is known in the art to employ fuming sulfuric acid ("oleum") to conduct polysulfonation of macroporous resins. It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine through routine

experimentation the optimal concentration of fuming sulfuric acid/oleum in an endeavor to obtain a macroporous resin having the desired extent of polysulfonation.

Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zoeller et al. (U. S. Patent No. 6,452,043) in view of Maroldo et al. (U. S. Patent No. 4,839,331).

Zoeller et al. disclose catalysts comprising a catalytically effective amount of an active metal selected from iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, and platinum (considered to read upon the limitations "Groups 4-12 of the Periodic Table" and "Groups 8-12 of the Periodic Table" in **claims 6 and 8**) and, optionally, a secondary metallic promoter, selected from alkali metals, alkaline earth metals, lanthanides, in which the active metal is associated with a support matrix comprising carbonized polysulfonated divinylbenzene-styrene copolymers. See col. 5, line 50 to col. 6, line 4 of Zoeller et al., which also makes reference to Maroldo et al. as suitable carbonized polysulfonated divinylbenzene-styrene copolymers (col. 6, lines 2-4).

Additionally, Zoeller et al. disclose that the active metal and secondary metal are associated with the support material as a result of soluble impregnation of the metals which may result in either a salt of the metals, an oxide of the metals, or metal in a free state deposited on the support. See col. 6, line 66 to col. 7, line 3 of Zoeller et al. This disclosure is considered to read upon the alkali metal and alkaline earth metal oxides recited in **claim 7**.

Although Zoeller et al. disclose a support matrix that reads upon the limitation "carbonized polysulfonated vinylaromatic polymer" recited in claim 6, the reference is silent with respect to the properties also recited in this claim.

Maroldo et al. is relied upon for its teachings with respect to claims 1-5 and 13-15, as stated above, with respect to the claimed properties of the carbonized polymer particles, as recited in claim 6.

Since the prior art appears to disclose the invention as claimed on the basis of inherent property characteristics which either anticipate or render the claimed product obvious (as addressed in the above 103(a) rejection, see paragraph 3), therefore, the burden of proof that it does or does not shifts to the applicant as in *In re Best* 195 USPQ 430, 433 (CCPA 1877).

Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zoeller et al. (U. S. Patent No. 6,235,673) in view of Maroldo et al. (U. S. Patent No. 4,839,331).

Zoeller et al. disclose catalysts comprising a catalytically effective amount of an active metal selected from iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, and platinum (considered to read upon the limitations "Groups 4-12 of the Periodic Table" and "Groups 8-12 of the Periodic Table" in **claims 6 and 8**) and, optionally, a secondary metallic promoter, selected from alkali metals, alkaline earth metals, lanthanides, in which the active metal is associated with a support matrix comprising carbonized polysulfonated divinylbenzene-styrene copolymers. See col. 4,

line 48 to col. 5, line 30 of Zoeller et al., which also makes reference to Maroldo et al. as suitable carbonized polysulfonated divinylbenzene-styrene copolymers (col. 5, line 28).

Additionally, Zoeller et al. disclose that the active metal and secondary metal are associated with the support material as a result of soluble impregnation of the metals which may result in either a salt of the metals, an oxide of the metals, or metal in a free state deposited on the support. See col. 6, lines 24-28 of Zoeller et al. This disclosure is considered to read upon the alkali metal and alkaline earth metal oxides recited in **claim 7**.

Although Zoeller et al. disclose a support matrix that reads upon the limitation "carbonized polysulfonated vinylaromatic polymer" recited in claim 6, the reference is silent with respect to the properties also recited in this claim.

Maroldo et al. is relied upon for its teachings with respect to claims 1-5 and 13-15, as stated above, with respect to the claimed properties of the carbonized polymer particles, as recited in claim 6.

Since the prior art appears to disclose the invention as claimed on the basis of inherent property characteristics which either anticipate or render the claimed product obvious (as addressed in the above 103(a) rejection; see paragraph 3), therefore, the burden of proof that it does or does not shifts to the applicant as in *In re Best* 195 USPQ 430, 433 (CCPA 1877).

(10) Response to Argument

In response to Appellants' arguments that the prior art does not teach or suggest Appellants' claimed particle size range of 1 to 200 μm, the Examiner respectfully points out that Maroldo et al. '331 at col. 4, lines 49-56 state:

"Although resin beads of the size produced by conventional suspension polymerization process are a useful size for the further reactions and end uses, the process may be conducted on **larger or smaller** beads, and even on ground macroporous resins produced in non-bead form. For adsorbent and separative use, the resins may **be further ground or selectively sieved to produce the desired particle size.**" (Emphasis added by the Examiner.)

From this disclosure, the skilled artisan would have been appreciative of these techniques and their ability to produce vinylaromatic polymer particles of a size sufficient to provide carbonized particles exhibiting Appellants' claimed average particle diameter.

Although Example 1 of Maroldo '331 discloses the production of particles having a diameter of 0.85-2.5 mm (850-2500 μm), this example is merely a preferred embodiment of Patentees' invention and should not be construed as its sole invention. Teachings of a reference are not limited to a preferred embodiment. In re Boe, 145 U.S.P.Q. 507 (CCPA 1966).

The same reasoning applies to that of the remaining references of record. A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including non-preferred embodiments. Merck & Co. v.

Biocraft Laboratories, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Patricia L. Hailey/plh
Examiner, Art Unit 1755
January 29, 2007

Conferees:

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